Talking Points
A Resource Adequacy Framework for the Pacific Northwest

Purpose:

BPA and the Northwest Power Planning Council are spearheading an effort to establish a consensus-based resource adequacy framework for the Pacific Northwest (PNW). The purpose of this framework is to provide a clear, consistent and unambiguous means of answering the question of whether the Region has adequate deliverable resources to meet its loads reliably and to develop an effective implementation approach.

Background:

In 2001, one of the lowest water years on record caught the PNW short by 4,000 aMWs on a critical water planning standard basis to meet electrical loads in the states of Oregon, Washington, Idaho and Montana. West-wide, areas of resource deficiency, a flawed market design in California, and market manipulation caused high and volatile prices as well as localized rolling blackouts. The fallout from the West Coast energy crisis included an economic recession from which the PNW is still recovering.

The crisis demonstrated that the public has little tolerance for high and volatile market prices over a prolonged period of time. It also became clear that the financial community will not lend money for power plant construction unless developers have power contracts in hand and/or utilities have included the costs of those contracts in their rates.

One way to help get needed resources developed is a resource adequacy framework. A resource adequacy standard would help utilities and their regulators gauge whether they have enough resources to meet their loads under a regionally accepted measure of generation sufficiency. A framework for implementing the standard would lay the foundation for those entities to plan for and acquire sufficient resources to meet load.

Messages:

A consensus-based PNW resource adequacy framework will help to assure stable and reasonable electricity market prices. This is because it lays the groundwork for timely construction of needed electricity system infrastructure. Shortages are among the factors that led to the market price spikes of 2000-2001.

A regional resource adequacy standard/framework is particularly important in light of the Regional Dialogue policy direction to limit BPA's sale of its lowest price power to the Federal Base System. If BPA is to reduce its role in acquiring new resources or power purchases, its customer utilities must both have a common understanding of what constitutes resource adequacy and must procure adequate resources to meet their load not served by BPA.

A resource adequacy standard is consistent with BPA's strategic objective to ". . . encourage regional actions that ensure adequate, efficient, and reliable transmission and power service."

The PNW Resource Adequacy Forum has been initiated. A technical committee is identifying potential ways to measure resource adequacy using various metrics and targets and is endeavoring to reach consensus on common protocols for load forecasting, resource counting and deliverability. The first meeting of a policy-level steering committee is being scheduled for September. This group will select a resource adequacy standard, consider whether and how to apply such a standard at the individual utility level and agree on an approach to implement such a standard.

QUESTIONS AND ANSWERS:

Why is this important to the PNW?

In an environment where an increasing number of parties will be taking on the responsibility for acquiring resources to serve regional load, a resource adequacy standard/framework is key to ensuring overall regional sufficiency of resources to meet load at reasonable costs. The PNW is unique, not only in the predominately hydroelectric nature of its resources, but also in the ratio of public utilities to investor-owned utilities (IOUs). Resource adequacy is more difficult to achieve in the PNW for the following reasons:

- In many years, normal or better than normal water conditions accompanied by abundant hydro generation can both mask a situation of resource deficiency and increase the capital risk of construction in a market with supply levels varying substantially from year to year; and
- There is a continuing lack of clarity about the responsibility for resource acquisition between the public utilities and Bonneville Power Administration (BPA).

The Council's regional power plan must operate effectively in the context of multiple decision-makers constructing or causing the acquisition of resources, maintaining an inventory of ready-to-develop projects, and paying for cost-

effective conservation. An equitable way for the Fifth Power Plan to accomplish its objectives is through the consensus-based selection of a regional resource adequacy framework.

What's involved in a resource adequacy framework?

The approach to assessing resource adequacy includes these basic components:

- Resource adequacy metrics – the measurement tool, or "yardstick," for assessing whether a region or a utility has adequate resources to serve load. Examples of resource adequacy metrics are Loss of Load Probability (LOLP), which is a probabilistic metric, and an energy load/resource balance under some type of adverse hydro condition, which is a deterministic metric.
- Resource adequacy target – a point on the resource adequacy yardstick where a utility and/or region is determined to have adequate resources to reliably serve load. Examples of resource adequacy standards are one day in 10 years LOLP, or an annual energy load/resources balance under an adverse hydro condition that represents the minimum generation available, at least, 85 percent of the time.
- Resource adequacy standard – a regionally agreed-upon measure and target that defines whether a utility and/or region has sufficient resources to reliably serve load under a variety of temperature and runoff conditions.
- Implementation – an agreement on how the standard will be applied (voluntary or mandatory, how assessments will be implemented, etc.)

How is this work related to the region's pursuit of transmission adequacy standards?

BPA and the Council are closely coordinating its efforts toward developing a resource adequacy standard with a parallel effort to develop transmission adequacy standards. Resource adequacy depends on the ability to ensure that generation can be delivered to load. Decisions on acquiring resources need to examine the availability of transmission. Further, sometimes the best "resource" decision is the construction of transmission infrastructure and vice-a-versa.

What's gone on so far in the effort to develop resource adequacy standards?

In July 2002, the Federal Energy Regulatory Commission (FERC), in its Standard Market Design Notice of Proposed Rulemaking, specified a national resource adequacy standard. Even before it officially terminated this rulemaking, FERC

recognized that it is a State responsibility to develop resource adequacy standards, and delegated it to the states and regions.

The North American Electric Reliability Council (NERC) is proceeding with the development of a Resource Adequacy Assessment Standard consistent with the provisions described in the associated Standard Authorization Request, which recommended that each of the ten reliability councils, or Regions (of which the Western Electricity Coordinating Council, or WECC, is one) develop resource adequacy criteria for their respective regions and/or sub-regions. The SAR also recommended that the reliability councils specify how such criteria would be used to assess how well the regions and/or sub-regions meet resource adequacy requirements. The recently passed Energy Policy Act of 2005 will likely make the implementation of NERC standards mandatory.

In 2004, the WECC Board tasked an ad hoc working group, the Resource Adequacy Workgroup (RAWG), with developing resource adequacy criteria to enable the assessment of whether the Western Interconnection and its sub-areas have sufficient resources to meet load. The RAWG developed consensus recommendations, which are being used to guide the development of resource adequacy guidelines by a newly established WECC subcommittee. The WECC Board has stated their role is to assess resource adequacy; the Board looks to the State and local jurisdictions in the Western Interconnection to implement mechanisms to achieve resource adequacy.

So why don't we just use the standard that WECC is developing?

Once developed, the WECC standard will address the entire interconnection and its sub-areas (14 western states, including 2 provinces of Canada and a small part of Mexico.) This may entail the development of a number of different metrics and targets. The PNW is unique among these areas. While most of the West is capacity-constrained and experiences summer peaks, the PNW is winter-peaking and energy-constrained. The utilities, generators, regulators and other energy stakeholders in the PNW are in the best position to define appropriate resource adequacy metric(s) and target(s) for the PNW.

What is being done, then, to establish a Northwest standard?

In 2003, the Council, with encouragement and assistance from PacifiCorp, BPA, the Northwest Power Pool and the Pacific Northwest Utilities Conference Committee, initiated a Power Supply Adequacy Forum. While participants (utilities, regulators, and energy stakeholders) did not reach a decision on a resource adequacy standard, they did agree on the need for common definitions

in forecasting loads and counting resources and consistent treatment of data before a resource adequacy standard could be developed.

The Council, in its Fifth Power Plan, included an action item to re-initiate the Power Supply Adequacy Forum. Two meetings of the Forum's Technical Committee have already been held, and a white paper addressing technical resource adequacy issues is being drafted. The first meeting of the Forum's Steering Committee is slated for September 16. The goal is for the Steering Committee to agree on a consensus-based resource adequacy standard by December 2005.

How does BPA intend to use such a standard?

BPA is working with the Council and other stakeholders to encourage the development of a resource adequacy standard. BPA believes resource adequacy needs to be addressed in the long-term power sales contracts (PSCs).

If the regional forum succeeds and develops consensus-based adequacy metrics and individual utility targets, a workable adequacy tracking mechanism, and an implementation approach that has regional support then a contract provision referencing the forum process should suffice in the PSCs. However, if the forum is not successful, the PSCs would need to include contract provisions that establish a definition for measuring adequacy, that specify reporting requirements and that establish implementation mechanisms.

Will this need to be a mandatory standard?

Consideration will need to be given to approaches that could result in mandatory compliance by the region's utilities. However, the best solution may be a voluntary standard, assuming that all utilities would voluntarily apply it and comply with it.

What type of resource adequacy metric might the Pacific Northwest use?

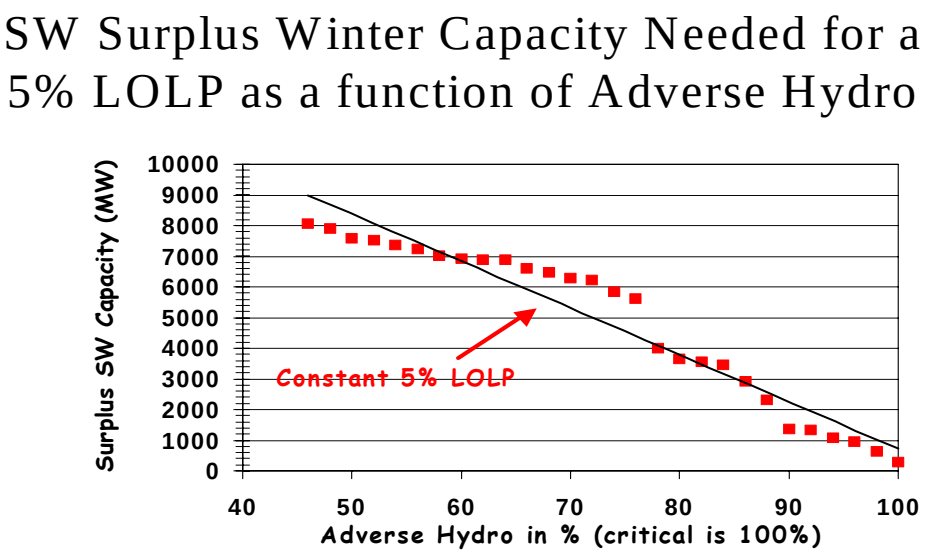
Energy Load/resource balance is probably the most familiar approach, comparing the output of an utility's resources with its projected loads, which had historically been done assuming critically dry hydro generation conditions.

However, over the past 15-20 years, it has become clearer that the PNW need not be considered an isolated region for purposes of resource adequacy. It is electrically interconnected with Canada, California, the Desert Southwest and the Rocky Mountain Area. California and the Southwest are summer peaking, and interties between these areas and the PNW allow each area to benefit from this

diversity. Therefore, the Council's resource adequacy metric proposes to define hydro generation on some definition of adverse hydro that is better than critical hydro, which by definition is the worst level of hydro generation on record.

The **Loss of Load Probability (LOLP)** metric, therefore, takes into account that surplus capacity will be available from outside the region. The LOLP metric is a function of native resources AND available imports. Historically, an LOLP of 5% or less for the PNW has been considered adequate.

However, the LOLP analysis is more complicated than a deterministic metric, requiring a computer-based simulation analysis, which may be very difficult for individual utilities to perform. With an eye toward a more practical approach, the Council's Fifth Power Plan explored an energy load/resource metric that is easier to use, but also takes out-of-region capacity into account. It looked at the combination of hydro conditions and winter import capability necessary to maintain a 5 percent LOLP. The graphic below depicts the approach:



The graph above shows that if, for example, we were confident of the availability of 3,000 MW of winter period surplus southwest capacity, the region could maintain a 5 percent LOLP by using the 85th percent adverse hydro condition for resource planning. In other words, long-term resource planning would aim to maintain a zero load/resource balance, based on the hydro energy expected from the 85th percentile water condition. As conditions in the southwest change, the amount of available winter surplus capacity changes. To assure that the region

maintains a five percent LOLP, the adverse hydro percentile used for planning would change according to the relationship in the figure above.

Won't the market take care of this? After all, more than 4,000 aMW of generation have been built in the wake of the 2001 West Coast energy crisis.

Yes and no. Although market prices did finally lead developers to build more generation, spot market mechanisms alone cannot assure resource adequacy. Electricity is a unique commodity that is not easily stored and must be supplied instantaneously to exactly meet load at the location of the load. Generating resources take one or two years, at least, to build. Permitting, siting, and planning may take longer. By the time the spot market signals a shortage (with price spikes), it's too late.

An additional complication is that the industry is in a composite state, with some electricity sold in an open market and some in a regulated environment. Because of the lag time between new demand and generation development, a spot market for electricity alone will generally not be a reliable incentive to build generation. Longer-term forward markets can provide efficient mechanisms for developing new resources. However, their success depends on the incentives provided to utilities to turn to those markets. Those incentives in the PNW are weakened by the two issues noted above -- the variability of water supplies and the lack of clarity about publicly owned utilities' responsibility to acquire resources to serve their loads.

Can we use demand response?

Demand response and conservation are important demand-side resources to assure resource adequacy, and they should be given appropriate credit in development of a resource adequacy standard. However, random electricity curtailments are very disruptive to society. And demand response is generally better suited to addressing short-term capacity shortages of a few hours or less. In the PNW, energy shortages can last an entire year. It is much more difficult to design a demand response program to effectively address a prolonged energy shortage than a short-term capacity shortage.

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